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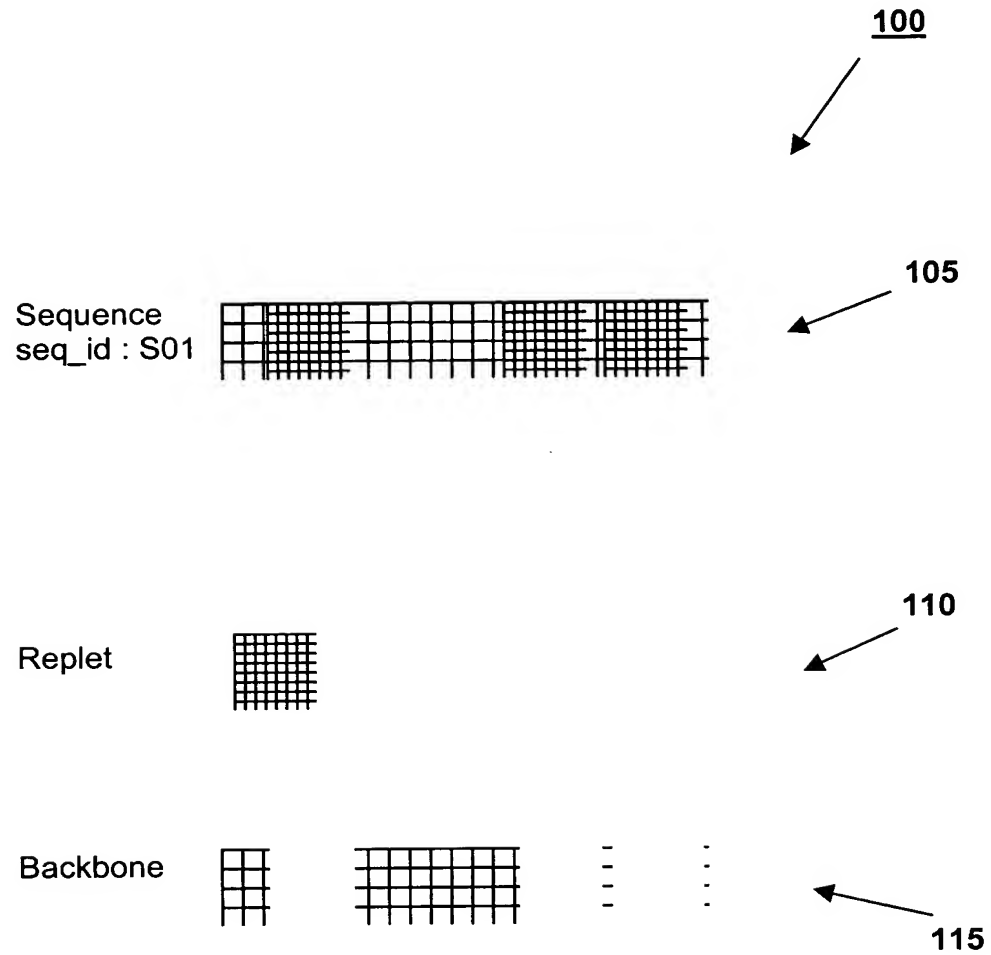


FIG. 1

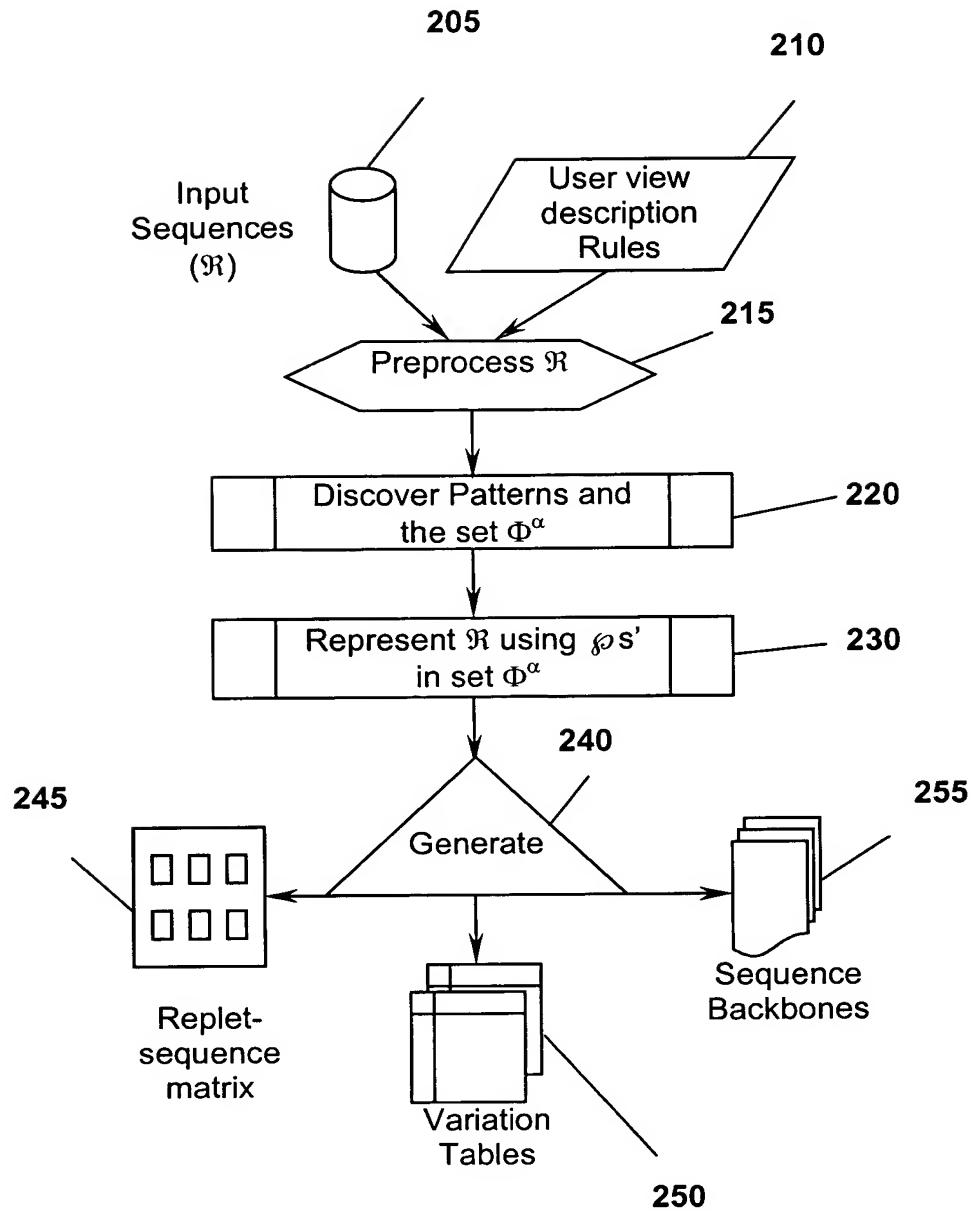


FIG. 2

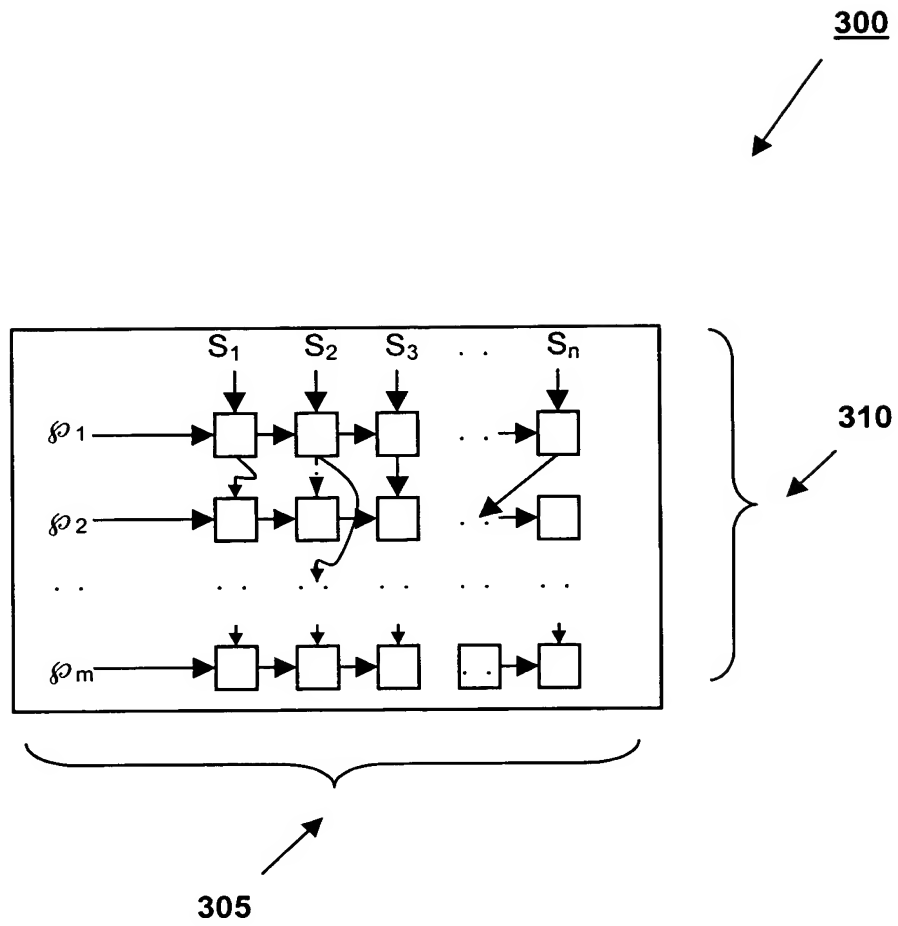


FIG. 3

400

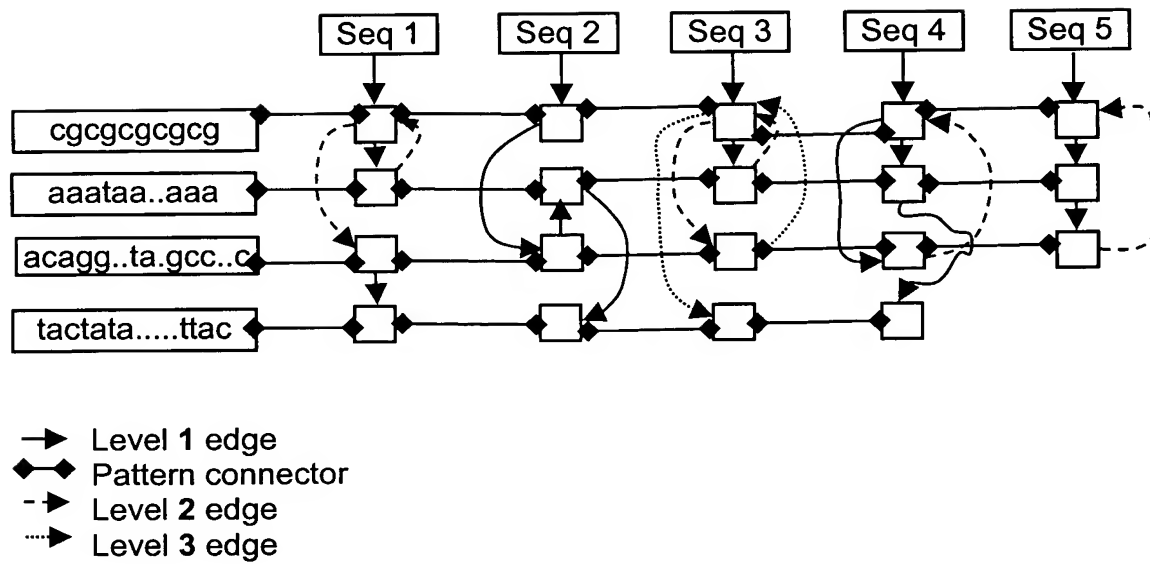


FIG. 4

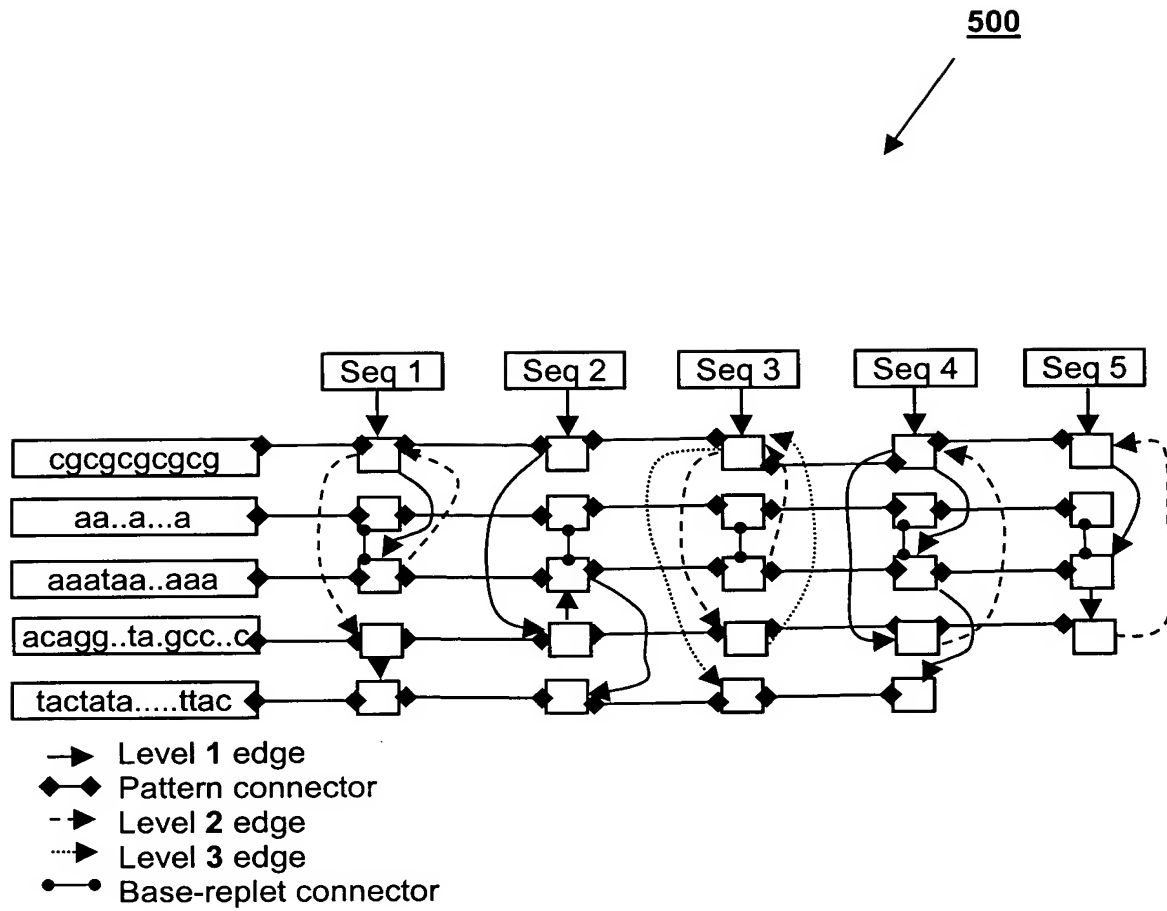


FIG. 5

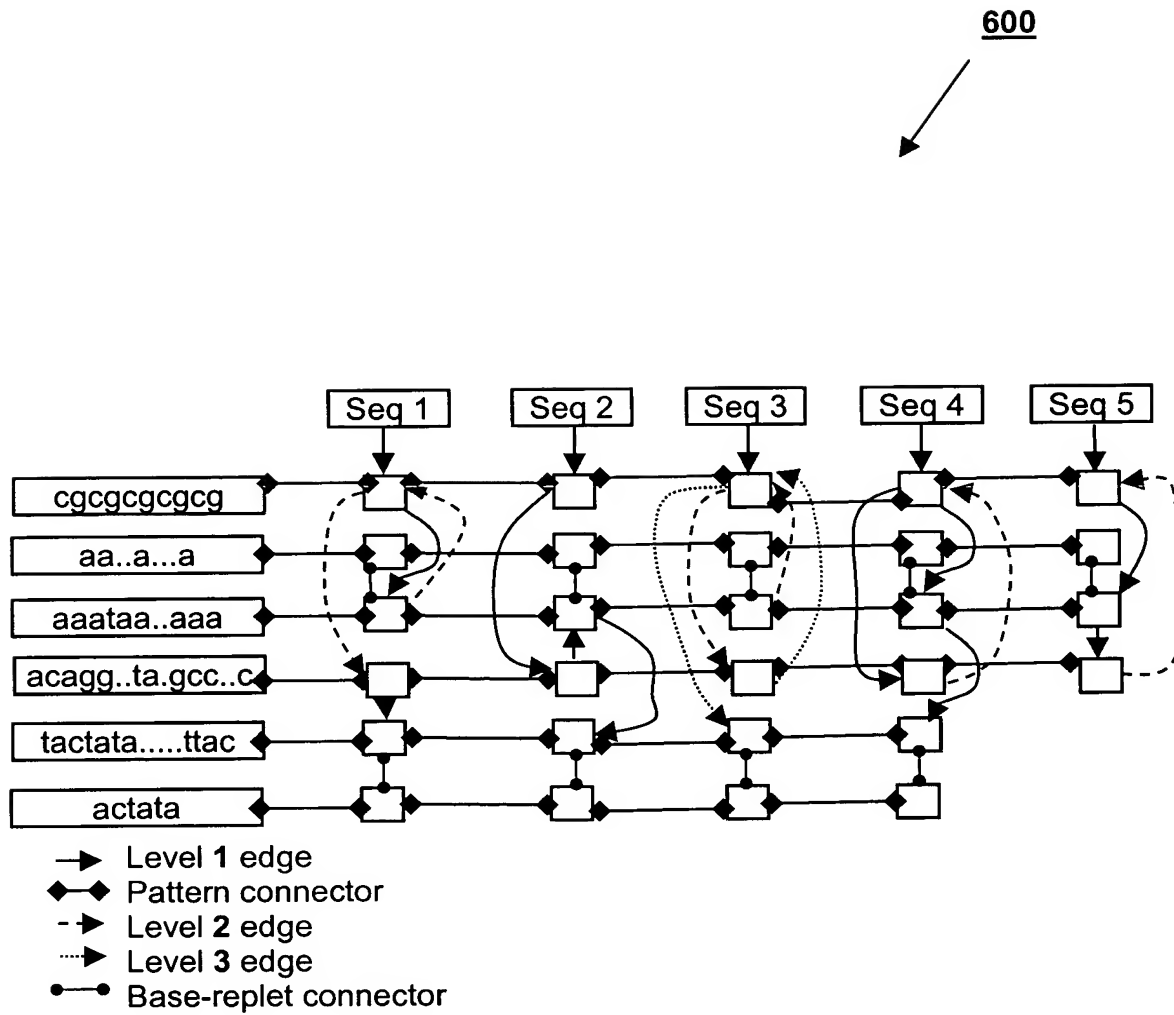


FIG. 6

Algorithm reconstruct (sequence-id seq\_id)

Begin

Backbone = getBackbone(seq\_id);

*/\* getBackbone(seq\_id) searches the backbone list and returns the backbone*

*corresponding to seq\_id\*/*

Match-Set mr = getheadof(seq\_id); */\* returns the first match-set instance of the sequence seq\_id\*/*

String seq="";

offset=0;

Hashtable ht = 0;

loopcnt=0;bptr=0;

While(mr!=null){ */\* 'null' represents the end of traversal\*/*

    roffset = getOffset(mr, loopcnt); */\* returns the loopcnt<sup>th</sup> offset (k+ $\delta$ ) of the instance mr\*/*

    if((roffset – poffset)>0){

        seq=concat(seq, substring(backbone, bptr, roffset-poffset));

        bptr=bptr+roffset-poffset;

    }

    poffset = roffset +length( getreplet(mr) ); */\*getreplet(mr) returns the replet in mr\*/*

    seq = concat(seq, resolve(getreplet(mr), getVarInfo(mr,roffset)));

*/\*getVarInfo(mr, roffset) provides the variation information for the replete in mr at the roffset\*/*

*/\* resolve(replet, var-info) generates the subsequence represented by replete+var-info\*/*

    add(mr,ht); */\* increments the occurrence count of replete in mr when traversing the sequence\*/*

    loopcnt = no-of-occurance(mr, ht);

*/\*no-of-occurance(mr, ht) returns the number of times the replete in mr has occurred upto this point of traversal\*/*

    mr = getnextbasematchset(mr, loopcnt –1);

*/\* getnextbasematchset(mr, cnt) provides the next occurring base replets match set Instance, this corresponds to the 'cnt'<sup>th</sup> pointer in the current mr\*/*

    loopcnt = no-of-occurance (mr, ht);

}

seq = concat(seq, substring(backbone, bptr, length(backbone)-1);

return seq;

End

FIG. 7

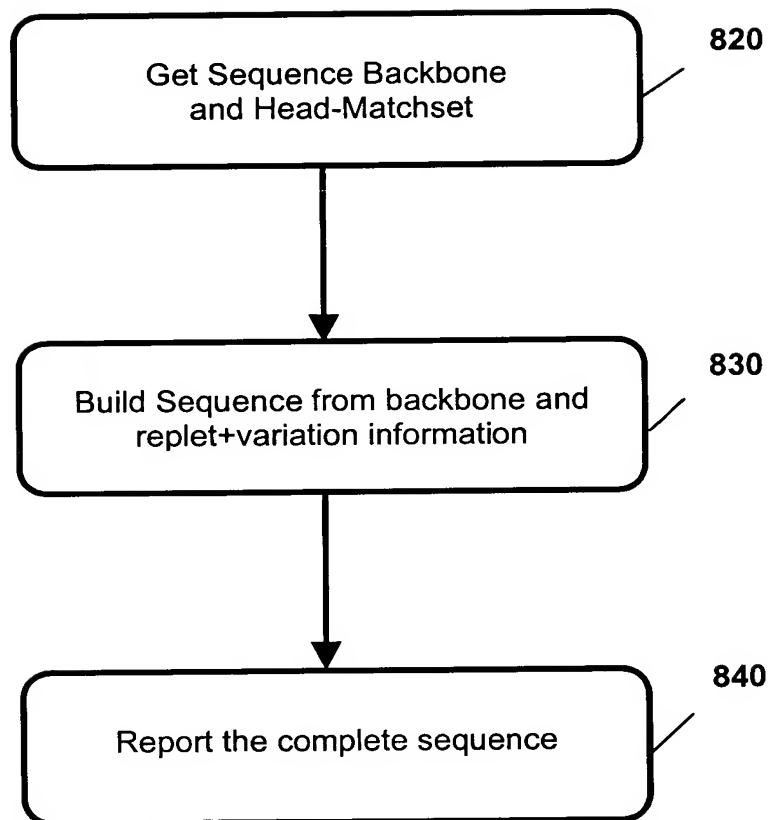


FIG. 8



Backbone = bseq 3: acttgatcggtagctagacggagaagctcccaaac

Base reptlets occurring in 3 are {cgcgcgcgcg, aaataa..aaa, acagg..ta.gcc..c, tactata.....ttac}

Match-set of the base reptlets are provided below

**1: cgcgcgcgcg**

```
{
Sequence-id = 3
Pattern-id = 1
Array of Matching-offsets <K,δ> = {18,39,83}
Array of Is-base-replet = {true, true, true}
Array of Pointer to Base-replet = {null, null, null}
Array of sequence-formation-edges = {2, 3, 4}
Pointer to next-pattern instance = {...}, Pointer to previous-pattern instance = {...}
}
```

**2: aaataa..aaa**

```
{
Sequence-id = 3
Pattern-id = 2
Array of Matching-offsets <K,δ> = {28}
Array of Is-base-replet = {true}
Array of Pointer to Base-replet = {null}
Array of sequence-formation-edges = {1}
Pointer to next-pattern instance = {...}, Pointer to previous-pattern instance = {...}
}
```

**3: acagg..ta.gcc..c**

```
{
Sequence-id = 3
Pattern-id = 3
Array of Matching-offsets <K,δ> = {49}
Array of Is-base-replet = {true}
Array of Pointer to Base-replet = {null}
Array of sequence-formation-edges = {1}
Pointer to next-pattern instance = {...}, Pointer to previous-pattern instance = {...}
}
```

**4: tactata.....ttac**

```
{
Sequence-id = 3
Pattern-id = 4
Array of Matching-offsets <K,δ> = {93}
Array of Is-base-replet = {true}
Array of Pointer to Base-replet = {null}
Array of sequence-formation-edges = {null}
Pointer to next-pattern instance = {...}, Pointer to previous-pattern instance = {...}
}
```

**FIG. 9A**

Start of first while loop

Bptr=0;seq="";offset=0;loopcnt=0;ht={};mr=1

Inside the loop

Roffset = 18;

Condition true -> Inside 'if'

Seq = acttgatcggtagctaga

Bptr= 18

Outside 'if'

poffset = 28

seq= acttgatcggtagctagacgcgcgcgcg

ht={<1,1>}

loopcnt=1

mr=2

loopcnt=0

Start of second loop as mr!=null

Roffset = 28

Condition false

Poffset=39

Seq=acttgatcggtagctagacgcgcgcgcgaaataattaa

ht={<1,1>,<2,1>}

loopcnt=1

mr=1

loopcnt=1

Start of third loop as mr!=null

Roffset =39

Condition false

Poffset= 49

Seq= acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcg

ht={<1,2>,<2,1>}

loopcnt=2

mr=3

loopcnt=0

Start of fourth loop as mr!=null

Roffset = 49

Condition false

Poffset=65

Seq= acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcgacaggtataggccaac

ht={<1,2>,<2,1>,<3,1>}

loopcnt=1

mr=1

loopcnt=2

**FIG. 9B**

Start of fifth loop as mr!=null

Roffset = 83

Condition true -> Inside 'if'

Seq=

acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcgcacaggtataggccaaccggagaagctcccaaac

Bptr=36

Outside 'if'

Poffset=93

Seq=

acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcgcacaggtataggccaaccggagaagctcccaaacgcgcgcgcgc

gcgcgcgcgc

ht={<1,3>,<2,1>,<3,1>}

loopcnt=3

mr=4

loopcnt=0

Start of sixth loop as mr!=null

Roffset =93

Condition false

Poffset=93

Seq=

acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcgcacaggtataggccaaccggagaagctcccaaacgcgcgcgcgc

gcgcgtactatatcatattac

ht={<1,3>,<2,1>,<3,1>,<4,1>}

loopcnt=1

mr=null

loopcnt=-1

The while loop is terminated as mr = null;

Outside while loop

There is no more subsequence of the backbone to be added to 'Seq'

Return seq

Output =

"acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcgcacaggtataggccaaccggagaagctcccaaacgcgcgcgcgcgtactatatcatattac"

**FIG. 9C**

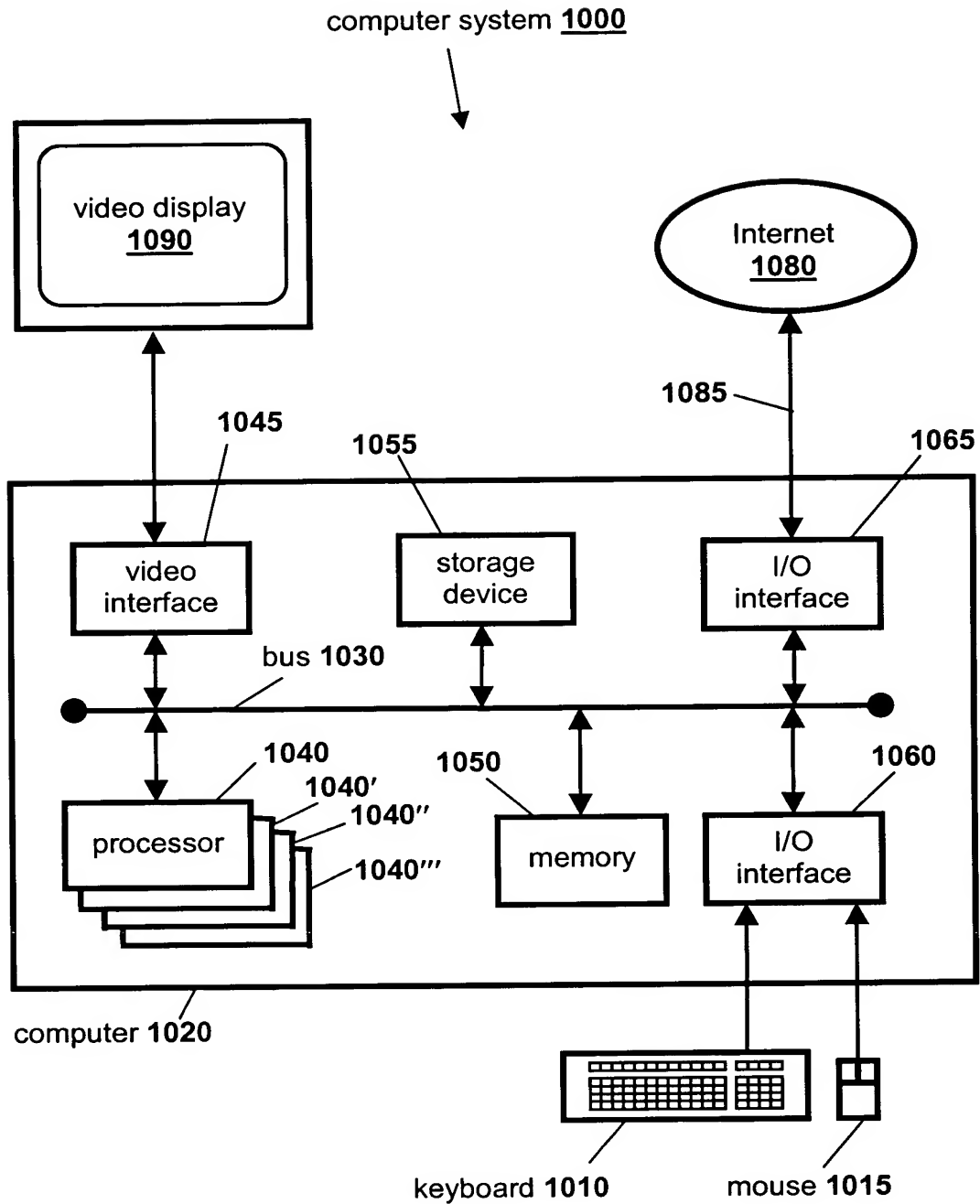


FIG. 10